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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/821,104

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Richard A. Keeney

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LAW OFFICE OF BARRY R LIPSITZ
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EXAMINER

LAROSE, COLIN M

ART UNIT

PAPER NUMBER

2623

DATE MAILED: 04/07/2004

10

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/821,104

Applicant(s)

KEENEY ET AL.

Examiner

Colin M. LaRose

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) _____ is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 63 and 64 is/are allowed.
- 6) ☒ Claim(s) 1,2,6-8,10-20,22-28,30-33,37-39,41-51,53-59,61 and 62 is/are rejected.
- 7) ☒ Claim(s) 9 and 40 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8 January 2004 has been entered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 2, 11-13, 15-17, 19, 20, 22, 23, 26, and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,764,803 by Jacquin et al. ("Jacquin").

Regarding claim 1, Jacquin discloses a method of digital image compression (figure 1), comprising:

identifying a plurality of areas of interest in a subset of digital images in a sequence of related images (column 3, lines 2-25: areas of interest in a current video frame are identified by the assignation of ellipses via the ellipse identifier 30);

extrapolating areas of interest for a remainder of images in the sequence from the identified areas of interest in said subset (column 7, lines 51-61: the ellipses of the current frame

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are used to predict, or create extrapolated versions of, ellipses in a successive frame; the predicted (extrapolated) ellipses are then used to positively locate the actual ellipses);

encoding the identified areas of interest at a first quality level and unidentified areas of the image at a second and lower quality level than the identified areas in order to produce a single compressed copy of each image which can be decoded at a decoder (column 3, lines 12-25 and first and second coders 32 and 34: areas of interest are coded with high quality; all other areas are coded with low quality; each image is then concatenated into a coded video signal which can be decoded).

Regarding claims 2, 11-13, 15-17, 19, 23, 26, and 28, Jacquin expressly discloses or suggests the features of these claims.

Regarding claim 20, Jacquin discloses a method (figure 1) of digital image compression comprising:

identifying a plurality of areas of interest in the digital image (30);

sampling the identified areas of interest at a higher spatial resolution than unidentified areas of the image (32: areas identified by ellipses are quantized with a higher spatial resolution);

encoding the identified areas of interest at a first quality level for transmission to a decoder in one or more additional data streams (first coder 32 produces a first data stream of finely quantized image data for the identified areas); and

encoding the unidentified areas of the image at a second and lower quality level than the identified areas for transmission to the decoder in a separate data stream from that containing the

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identified areas (second coder 34 produces a second data stream (separate from the first data stream) of coarsely quantized image data for the unidentified areas;

wherein said data stream containing said unidentified areas does not contain any information needed to recreate said identified areas of interest (as can be seen in figure 1, coding of the unidentified areas is exclusive of the coding of the identified areas and does not contain information pertaining to the identified areas).

Regarding claim 22, Jacquin discloses first and second coding methods, as claimed (32 and 34, figure 1).

Claim Rejections - 35 USC § 103

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 25, 32, 33, 42-44, 46-48, 50, 51, 53, 54, 56, 57, and 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacquin in view of U.S. Patent 6,476,873 by Maeng.

Regarding claim 32, Jacquin discloses a system for digital image compression (figure 1), comprising:

means for identifying a plurality of areas of interest in a subset of digital images in a sequence of related images (column 3, lines 2-25: areas of interest in a current video frame are identified by the assignment of ellipses via the ellipse identifier 30);

means for extrapolating areas of interest for a remainder of images in the sequence from the identified areas of interest in said subset (column 7, lines 51-61: the ellipses of the current

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frame are used to predict, or create extrapolated versions of, ellipses in a successive frame; the predicted (extrapolated) ellipses are then used to positively locate the actual ellipses);

an encoder for encoding the identified areas of interest at a first quality level and unidentified areas of the image at a second and lower quality level than the identified areas in order to produce a single compressed copy of each image which can be decoded at a decoder (column 3, lines 12-25 and first and second coders 32 and 34: areas of interest are coded with high quality; all other areas are coded with low quality; each image is then concatenated into a coded video signal which can be decoded).

Jacquin does not expressly disclose a digital image display.

Maeng discloses a digital image display (195, figure 1) for displaying decoded video signals. I would have been obvious to modify Jacquin by Maeng to include a display as claimed since a display device allows an image to be viewed.

Regarding claims 33, 42-44, 46-48, 50, 54, 57, and 59, Jacquin expressly discloses or suggests the features of these claims.

Regarding claims 25 and 56, Jacquin is silent to reducing the quality of the unidentified areas for security purposes.

Maeng discloses a similar encoding system, wherein regions of interest within an image are encoded at higher quality levels than the unidentified areas. In, particular, Maeng teaches that, inter alia, reducing the quality of the unidentified areas is useful for remote security systems (column 2, lines 44-52).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Jacquin by Maeng to achieve the claimed invention since Maeng teaches that, inter alia, reducing the quality of unidentified areas is useful for security purposes.

Regarding claim 51, Jacquin discloses a system (figure 1) of digital image compression comprising means for:

identifying a plurality of areas of interest in the digital image (30);

sampling the identified areas of interest at a higher spatial resolution than unidentified areas of the image (32: areas identified by ellipses are quantized with a higher spatial resolution);

encoding the identified areas of interest at a first quality level for transmission to a decoder in one or more additional data streams (first coder 32 produces a first data stream of finely quantized image data for the identified areas); and

encoding the unidentified areas of the image at a second and lower quality level than the identified areas for transmission to the decoder in a separate data stream from that containing the identified areas (second coder 34 produces a second data stream (separate from the first data stream) of coarsely quantized image data for the unidentified areas;

wherein said data stream containing said unidentified areas does not contain any information needed to recreate said identified areas of interest (as can be seen in figure 1, coding of the unidentified areas is exclusive of the coding of the identified areas and does not contain information pertaining to the identified areas).

Jacquin does not expressly disclose a digital image display.

Maeng discloses a digital image display (195, figure 1) for displaying decoded video signals. I would have been obvious to modify Jacquin by Maeng to include a display as claimed since a display device allows an image to be viewed.

Regarding claim 53, Jacquin discloses first and second coding methods, as claimed (32 and 34, figure 1).

6. Claims 24, 27, 55, and 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacquin in view of Maeng, and further in view of "Lossy/Lossless Region-of-Interest Coding Based on Set Partitioning in Hierarchical Trees" by Atsumi et al. ("Atsumi").

Regarding claims 24 and 55, Jacquin is silent to identifying the areas of interest while the image is displayed.

Atsumi discloses an image encoding method wherein transform coefficients of regions of interest can be selected while the image is being encoded and transmitted (see Abstract and section 2.2). Also, while the user is viewing the partial image during progressive reconstruction, the user identifies the areas of interest deemed to be the most important (section 2.2).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Jacquin by Atsumi to include the claimed features of claims 11, 23, 24, 42, 54, and 55 since Atsumi teaches that, inter alia, identifying areas of interest during transmission and partial display is useful for interactive browsing (see Abstract).

Regarding claims 27 and 58, Jacquin is silent to transmitting the higher quality areas first, followed by the lower quality areas.

Atsumi teaches shifting the highest priority areas of interest (ROIs) to the beginning of the bitstream so that so that the areas of higher interest are transmitted before the areas of lower interest (see section 2.1). As a result, the image is built up starting with the areas of high interest.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Jacquin by Atsumi to achieve the claimed invention since Atsumi teaches that transmitting and building up the highest priority areas first “enables the user to terminate transmission as soon as the ROI is reconstructed with a quality acceptable to the user, thus saving bandwidth (or time) and computational cost” (section 1, 1st paragraph).

7. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jacquin in view of U.S. Patent 6,256,423 by Krishnamurthy et al. (“Krishnamurthy”).

8. Claim 45 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jacquin in view of Maeng, and further in view of U.S. Patent 6,256,423 by Krishnamurthy et al. (“Krishnamurthy”).

Regarding claims 14 and 45, Jacquin is silent to providing a gradual transition as claimed.

Krishnamurthy discloses a similar system for coding ROIs, wherein a transition region is provided to create a gradual transition between differently coded areas (see figure 1).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Jacquin (and Maeng) by Krishnamurthy to achieve the claimed invention since

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Krishnamurthy teaches that a transition region should be included to avoid abrupt variations in quality (column 4, lines 60-64).

9. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jacquin in view of U.S. Patent 6,144,772 by Garland et al. ("Garland").

10. Claim 38 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jacquin in view of Maeng, and further in view of U.S. Patent 6,144,772 by Garland et al. ("Garland").

Regarding claims 7 and 38, Jacquin does not disclose the areas of interest are designated by a pointing device as claimed.

Garland discloses an image compression system similar to that of Jacquin wherein areas of interest are designated and encoded at different levels of quality. Whereas Jacquin teaches the automatic selection of areas of interest in a video frame, Garland teaches areas of interest can be designated by user manipulation of a pointing device (column 2, lines 11-15).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Jacquin (and Maeng) by Garland to achieve the claimed invention since Garland discloses that areas of interest can be designated based on user preference rather than automatic selection.

11. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jacquin in view of U.S. Patent 5,896,176 by Das et al. ("Das").

12. Claim 49 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jacquin in view of Maeng, and further in view of U.S. Patent 5,896,176 by Das et al. ("Das").

Regarding claims 18 and 49, Jacquin utilizes the DCT transform but does not expressly disclose using a wavelet transform to encode the image.

Das discloses an MPEG coding system, similar to that of Jacquin, wherein wavelet encoding is utilized in lieu of DCT coding (column 10, lines 40+).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Jacquin (and Maeng) by Das to utilize wavelets for encoding, since Das teaches that, in the MPEG environment, wavelet transforms may advantageously replace the DCT transform for the purposes of image encoding.

13. Claims 6, 8, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacquin, as applied to claim 1, in view of U.S. Patent 6,389,169 by Stark et al. ("Stark").

14. Claims 37, 39, and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacquin in view of Maeng, as applied to claim 32, in view of U.S. Patent 6,389,169 by Stark et al. ("Stark").

Regarding claims 6, 8, 37, and 39, Jacquin (and Maeng) silent to identifying the areas of interest by tracking the eye gaze point of a group of viewers, as claimed.

Stark discloses a method for processing image data based on anticipated regions of interest. In particular, Stark's method of identifying areas of interest comprises tracking human eye movements to determine those areas of an image that have the highest visual relevance. This information on the visual relevance is then used to identify areas of interest within the image (see column 7, line 61 through column 8, line 7; column 8, line 59 through column 9, line 7; and column 9, lines 36-44).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Jacquin by Stark to achieve the claimed invention since Stark teaches that identifying the areas of interest by tracking eye gaze movements of several viewers improves compressed image quality (column 2, lines 37-44 and column 9, lines 1-7).

Regarding claims 10 and 41, figure 8a of Stark illustrates the frequency of fixation loci 52 for different areas of the image. Figure 8a is essentially a visual histogram in that it displays locus frequencies for different image areas. Areas with a high frequency of loci are determined to be the most “popular” areas, as shown in figure 8b.

15. Claims 30 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacquin, as applied to claim 1, in view of U.S. Patent 6,356,664 by Dunn et al. (“Dunn”).

16. Claims 61 and 62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacquin in view of Maeng, as applied to claim 32, in view of U.S. Patent 6,356,664 by Dunn et al. (“Dunn”).

Regarding claims 30 and 61, Jacquin is silent to enhancing the quality levels of unidentified areas to artificially create additional areas of interest to draw a viewer’s attention, as claimed.

Dunn discloses a system for priority-encoding regions of interest in video data, similar to that of Jacquin. In particular, Dunn discloses enhancing the quality levels of certain objects in an image in order to draw a viewer’s attention to the objects (figure 9 and column 8, line 61 through column 9, line 10).

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It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Jacquin (and Maeng) by Dunn to enhance certain areas of the image to draw attention to those areas, as claimed, since Dunn teaches that this feature is useful for advertising purposes.

Regarding claims 31 and 62, Dunn discloses the areas of interest are products (column 8, lines 61-67).

Allowable Subject Matter

17. Claims 9 and 40 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 63 and 64 are allowed.

Regarding claims 9, 40, 63, and 64, the prior art of record does not disclose or suggest the claimed features for encoding an image, wherein the group of viewers used to determine the areas of interest is a statistically representative subset of an intended audience, and said subset of the intended audience is utilized for the purposes of predicting areas of interest for the intended audience.

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Colin M. LaRose whose telephone number is (703) 306-3489.

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The examiner can normally be reached Monday through Thursday from 8:00 to 5:30. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au, can be reached on (703) 308-6604. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the TC 2600 Customer Service Office whose telephone number is (703) 306-0377.


AMELIA M. AU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

CML

Group Art Unit 2623

5 April 2004